

Pre-employment Physical Abilities Test (PAT) Rationale

Job Descriptions: Direct Care Workers, such as, but not limited to: Groupworkers, Caseworkers, Transportation Officers, Detention Coordinators, AWOL Apprehension Officers

Purpose of Test:

Direct Care Workers are responsible for the care and custody of youth committed to the Department of Youth Services. These youth range in age from 12 to 21 years of age and are committed for a variety of violent and nonviolent offenses. Care of these youth can involve highly physically demanding tasks such as: physical restraint to prevent youth from injuring self or others, self defense during an assault, and transfer of an uncooperative youth from one area to another, and extrication of incapacitated youth in emergency situations. Physical demands at this level are classified as Extra Heavy Physical Demand Labor under the Dictionary of Occupational Titles published by the U.S. Department of Labor. Due to the life safety issues involved in performing the essential functions of these job categories, all new applicants must demonstrate sufficient endurance, strength, flexibility, and cardiovascular fitness to safely meet the physical demands of the essential functions of the job.

The Physical Abilities Test is designed to simulate actual emergency situations that occur on the job. Items 1 through 8 of the test are performed in an obstacle course format, progressing through the sequence of test items in a continuous manner. Heart rate is monitored throughout the obstacle course portion, with maximum cardiovascular tolerance defined by the Maximal Training Heart Rate (MTHR) of 90% utilizing the Karvonen formula¹. 90+% is commonly recognized as above the Anaerobic Threshold, the point at which the body has insufficient oxygen and can no longer effectively remove lactic acid from the muscles². If an Officer applicant exceeds MTHR during the performance of this work simulation, the applicant has demonstrated they have insufficient cardiovascular reserve and would therefore be a risk to themselves and others in actual emergency situation on the job.

Rationale for specific test procedures:

1. Run on treadmill 6 minutes at 5 mph

Groupworkers and Caseworkers must occasionally respond to emergency situations. These codes can involve fights among youth, or an assault on staff, or a medical emergency involving one or more of the youth. Certain emergencies require only a response from workers in the direct vicinity. Other emergencies require responses from workers throughout the facility, including those at the opposite corner of the campus. Workers must be able to run quickly from one section of the campus to another and still have sufficient strength and cardiovascular endurance to respond to the emergency situation. A half mile run at a pace of 5 mph is equivalent to a 12 minute mile pace. It is anticipated that workers should be able to respond quicker than within 6 minutes to the half mile distance to the other side of the campus. But, this pace is chosen as a reasonable demand for pre-placement purposes.

2. Up/down 12 in. step at 24 steps (up, up, down, down)/min. for 3 mins.

Some buildings within the DYS system include five to six stories. If a Worker is at the top floor of one building and must respond to an emergency on the top floor of another building, he or she must be able to rapidly descend five to six stories of steps, run to the other building, and ascend

the six stories of the building calling the emergency. At 12 steps per story, 24 steps per minute for three minutes, is the equivalent of ascending and descending six stories. (Note: A comparable cardiovascular endurance test is utilized by similar employers such as U.S. Border Patrol³.)

3. Lift and carry 55 pound mannequin 100 feet.

Removal of unresponsive older youth or an injured coworker from an emergency situation can require a Worker to participate in lifting and carrying an individual. For the purposes of this test, the work simulation scenario involves two Workers carrying a 110 pound person out of a building. (This examiner has treated a DYS employee who was injured while assisting in carrying a 240 pound restrained youth down two flights of stairs). Each Worker in this scenario is therefore required to lift and carry half the unresponsive person's body weight, 55 pounds. This weight level is chosen (as opposed to the higher weight of 120 pounds, half of 240 pounds) as normative data published by Snook and Ciriello⁴ reports 57 pounds as the 50th percentile for adult females as the reasonable expectation for long distance carrying.

4. Drag 155 pounds on sheet, 25 feet.

If an Worker must remove an unresponsive youth from an emergency situation, and does not have a second Worker to assist with a lift and carry, the Worker must remove the individual from the situation by dragging the individual grasping under the shoulders, or dragging them on a sheet. Dragging 155 pounds on a cotton sheet, on a concrete or vinyl tile floor, requires approximately 50 pounds of horizontal force, as measured by a Chatillon dynamometer. This force range is within normal limits for youth males as documented by Snook and Ciriello⁴.

5. Sled push/pull with 40 lbs. horizontal force, (40 lbs. in sled), 40 feet, 5 reps, in 120 secs.

Physical restraint of uncooperative youth, who are trying to harm themselves or others, requires that Workers exert forceful gripping and altering whole body pushing and pulling force to gain control of the uncooperative individual. The Worker must have sufficient strength and muscular endurance to perform this task while minimizing the risk of injury to the youth. Pushing and pulling forces at the 50th percentile for adult females are documented as approximately 44 pounds of horizontal force by Snook and Ciriello⁴. Workers should be able to exert at least average upper body strength for pushing and pulling to be able to participate in performing this essential function of the job. Pushing and pulling of a weighted sled is utilized to simulate the sustained forces required to complete this job task.

6. Maximum lift floor to waist level 90 pounds, 5 repetitions, < 30 seconds.

Stretchers used to move unresponsive or injured youth weigh approximately 60 pounds. If two Workers must lift a 120 pound youth on a stretcher, each Worker will be required to lift 90 pounds. Larger youth of higher weight levels would naturally require an even higher exertion of force on the part of the Workers. 90 pounds is selected for this test as this is below the normative 50th percentile for adult males lifting floor to waist as documented by Snook and Ciriello⁴.

7. Maximum lift floor to elbow level 60 pounds, 5 repetitions, < 30 seconds.

Lifting and moving of an uncooperative or restrained youth of 120 pounds in weight would require two workers to lift 60 pounds each. Performance of this task can require 60 pounds or more of lifting force from waist to elbow level. 60 pounds is selected for this test as this is below the normative 50th percentile for adult males lifting floor to chest level as documented by Snook and Ciriello⁴.

8. Assume sustained stoop (60 degree trunk flexion) position for 60 seconds.

Youth who are at risk of harming themselves or others must sometimes be secured to prevent them from harming themselves. Application of restraints requires that Workers must bend at the waist for minutes at a time to safely secure the restraints such that the youth cannot harm himself and is not harmed by the restraints. Safety policies also require that restraints be checked periodically to make sure circulation to extremities is not impaired. Checking the restraints also requires frequent bending at the waist.

9. Assume sustained crouch/squat position for 60 seconds.

Youth being transported to and from court appearances, or being transported to another facility, must be secured. Workers participating in transportation typically secure a number of youth in a brief period of time, to prepare them for transport as a group. Performing this task can require frequent or continuous squatting for the Worker.

10. Assume sustained bilateral kneel on vinyl tile (or concrete) position for 60 seconds.

Depending on the location and amount of space available, restraint of youth can also require frequent or sustained kneeling by the Worker, to secure the restraints or maintain safety for the youth until the youth is no longer combative.

References

1. Karvonen MJ, Kantala E, Mustala O. The effects of training on heart rate. Acta Medica Exp Fenn 1957; 35:308-315
2. Fitness Heart Rate Zones. www.fitzones.com/members/Fitness/hearttrate_zones.asp.
3. CBP Border Patrol Fitness Test; www.cbp.gov/.../careers/customs_careers/border_careers/bp_agent_fitness/bp_agent_fit.ctt/bp_agent_fit.pdf.
4. Snook, Ciriello: The design of manual handling tasks: revised table of maximum acceptable weights and forces. Ergonomics, 1991, vol. 34, no. 9, pp. 1197-1213)